

INTEGRATED AND MODULAR BSP/MEA/MANIFOLD
PLATES FOR FUEL CELLS
ABSTRACT OF THE DISCLOSURE

5 The present invention concerns improvements in fuel cell fabrication. It concerns an improved, integrated and modular BSP/MEA/Manifolds, which facilitates single cell (module) leak and performance testing prior to assembly in a fuel cell stack as well as facilitating manufacturing and cost reduction.

 In particular, the present invention relates to a fuel cell, which includes:

- 10 a) A single flexible or ridged separator plate; b) a flexible membrane electrode assembly; c) a flexible bond interposed between said single flexible or ridged separator plate and said flexible membrane electrode assembly, wherein said flexible bond between said flexible or ridged separator plate and said flexible membrane electrode assembly comprises the fuel cell, and
- 15 wherein said flexible bond is an adhesive bond which encapsulates edge portions of said flexible or ridged separator plate and said flexible membrane electrode assembly and wherein said flexible bond seals the edge portions of said flexible membrane assembly to prevent the release of reactants from the fuel cell. In some embodiments the adhesive bond comprises a flexible
- 20 gasket; d) manifold for the delivery and removal of reactants and reactant products to and from the fuel cell reactive areas where said manifolds may be either a single or multiple manifolds; and e) a bond interposed between said manifold and said single flexible or ridged separator plate, wherein said bond affixes said manifold to said flexible or ridged separator plate and
- 25 wherein said bond provides a seal between said manifold and said flexible or ridged separator plate to prevent the release of reactants from the fuel cell. It also eliminates some gaskets and simplifies assembly.